# Comments on Volume 3, Chapters 20-24

Tracy Hemmeter [themmeter@valleywater.org]

**Sent:** Tuesday, December 03, 2013 12:33 AM
**To:** DWR CWP Comments
**Attachments:** Comments on Vol3_Ch20_Urba~1.pdf (617 KB) ; Comments on Vol3_Ch21_AgLa~1.pdf (392 KB) ; Comments on Vol3_Ch22_Ecos~1.pdf (366 KB) ; Comments on Vol3_Ch23_Fore~1.pdf (357 KB) ; Comments on Vol3_Ch24_Land~1.pdf (383 KB)

Here are the Santa Clara Valley Water District's comments on California Water Plan Update 2013 Volume 3, Chapters 20-24.

Santa Clara Valley Water District

TRACY HEMMETER
SENIOR PROJECT MANAGER
Water Utility Enterprise
Santa Clara Valley Water District
(408) 630-2647
themmeter@valleywater.org

# Chapter 20. Urban Stormwater Runoff Management

Urban stormwater runoff management is a broad series of activities to manage both stormwater and dry-weather runoff. Dry-weather runoff occurs when, for example, excess landscape irrigation water flows to the storm drain. Traditionally, urban stormwater runoff management was viewed as a response to flood control concerns resulting from the effects of urbanization. Concerns about the water quality impacts of urban runoff have led water agencies to look at watershed approaches to control runoff and provide other benefits (see Box 20-1, "Objectives of Urban Stormwater Runoff Management"). As a result, urban stormwater runoff management is now linked to other resource management strategies, including pollution prevention (covered in Chapter 18 of this volume), land use planning and management (Chapter 24), watershed management (Chapter 27), urban water use efficiency (Chapter 3), municipal recycled water (Chapter 12), recharge area protection (Chapter 25), and conjunctive management and groundwater (Chapter 9).

**PLACEHOLDER Box 20-1 Objectives of Urban Stormwater Runoff Management**

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

## Urban Stormwater Runoff Management in California

The traditional approach to runoff management views urban runoff as a flood management problem in which water needs to be conveyed as quickly as possible from urban areas to waterways in order to protect public safety and property. Consequently, precipitation-induced runoff in urban areas has been viewed as waste, and not a resource.

Urbanization alters flow pathways, water storage, pollutant levels, rates of evaporation, groundwater recharge, surface runoff, the timing and extent of flooding, the sediment yield of rivers, and the suitability and viability of aquatic habitats. The traditional approach to managing urban and stormwater runoff has generally been successful at preventing flood damage, but it has several disadvantages. In order to convey water quickly, natural waterways are often straightened and lined with concrete, resulting in a loss of habitat and impacts on natural stream physical and biological processes. Urbanization creates impervious surfaces, meaning stormwater does not infiltrate into subsurface aquifers. These impervious surfaces collect pollutants that are washed off to surface waters when it rains. The impervious surfaces also increase runoff volumes and velocities, resulting in streambank erosion, and potential flooding problems downstream. Because of the emphasis on removing the water quickly, the opportunity to use storm-generated runoff for multiple benefits is reduced.

A watershed approach for urban stormwater runoff management tries to emulate and preserve the natural hydrologic cycle that is altered by urbanization. The watershed approach consists of a series of best management practices (BMPs) designed to reduce the pollutant loading and reduce the volumes and velocities of urban runoff discharged to surface waters. These BMPs may include facilities to capture, treat, and recharge groundwater with urban runoff; public education campaigns to inform the public about

# Summary of Comments on Vol3_Ch20_UrbanStormwaterRunoffManagement_PubReviewDraft_Final_PDFed_co_wo_JAM_Edit.pdf

## Page: 3

Number: 1 Author: Johnmchu Subject: Highlight Date: 11/14/2013 2:16:48 PM

The title for this chapter and the terminology used should be more accurately described as *Urban Runoff Management*. Terms often are redefined as understating advances; runoff can create a problem regardless of its connection to storms.

Number: 2 Author: Johnmchu Subject: Highlight Date: 11/21/2013 8:56:22 AM

We suggest that these sentences be rewritten to explain the benefits of the watershed approach (hydraulic connections and contained within the jurisdiction of a single regional board) and the nexus between runoff and water pollution. To accomplish this we suggest inserting a table with the causes of pollution as it relates to different aspects of runoff. Also the affects of runoff on water quality are more complicated than summarized and should include those outlined in Stormwater Pollution Prevention Plan Permits.

stormwater pollution, including the proper use and disposal of household chemicals; and technical assistance and stormwater pollution prevention training.

Methods for recharging groundwater with urban runoff include having roof runoff drain to vegetated areas; draining runoff from parking lots, driveways, and walkways into landscaped areas with permeable soils; using dry wells and permeable surfaces; and collecting and routing stormwater runoff to basins. Infiltration may require the use of source control and pretreatment before infiltration. Infiltration enables the soil to naturally filter many of the pollutants found in runoff and reduces the volume and pollutant load of the runoff that is discharged to surface waters. An example is the Elmer Avenue Neighborhood Retrofit Demonstration Project (see Box 20-2). The watershed approach will not prevent, nor should it prevent, all urban runoff from entering waterways. Elements of the traditional conveyance and storage strategy are still needed in order to protect downstream beneficial uses, protect water right holders, and protect the public from floods. In addition to infiltration of stormwater, other BMPs include the use of rain barrels and cisterns to "harvest" stormwater for later use (e.g., irrigation), and the use of structural controls that are designed to capture stormwater runoff and slowly release it into streams in order to mimic the natural hydrograph that existed before development occurred. In Los Angeles, the nonprofit TreePeople organization constructed a 216,000-gallon cistern in Coldwater Canyon Park to collect and store stormwater from building rooftops and parking lots for irrigation use during the dry months (see Box 20-3).

**PLACEHOLDER Box 20-2 Elmer Avenue Neighborhood Retrofit Demonstration Project**

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

**PLACEHOLDER Box 20-3 Stormwater Cistern, Coldwater Canyon Park, Los Angeles**

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Urban stormwater runoff management has become more important and more controversial over the last two decades as municipal governments have been held increasingly responsible for pollutants washed from developed and developing areas within their jurisdictions into the storm sewer system and discharged into waterways. Unlike pollution from industrial and sewage treatment plants, pollutants in urban runoff and stormwater runoff come from many diffuse sources (see Box 20-4) and typically are not treated prior to being discharged to surface waters. As rainfall or snowmelt moves over the urban landscape, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and, potentially, groundwater. Pollution associated with discharges from a storm sewer system can occur outside of storms also, from landscape irrigation flows, improper disposal of trash or yard waste, illegal dumping, and leaky septic systems.

**PLACEHOLDER Box 20-4 Examples of Pollution in the Urban Environment**

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of this chapter.]

Runoff in the urban environment, both storm-generated and dry weather flows, has been shown to be a significant source of pollutants to the surface waters of the nation. As a result, the 1987 amendments to the federal Clean Water Act (CWA) required that discharges from municipal separate storm sewer

# Page: 4

Number: 1 Author: Johnmchu Subject: Highlight Date: 11/14/2013 9:29:23 AM

Number: 2 Author: Johnmchu Subject: Sticky Note Date: 11/14/2013 3:21:43 PM

Trash mentioned here and again in Potential Costs should be further discussed in the chapter as this source of pollution often occurs in urban environments leading to degradation of water quality and simple pollution prevention activities have been demonstrated through product alternatives, education, and collection.

uses are considered to be impaired and water quality standards are no longer met. Through the process of establishing the Section 303(d) list of impaired water bodies, it has often been found that urban runoff is a source of pollutants contributing to the impairment.

NPDES permits now issued to local agencies for discharges of stormwater require the implementation of specific measures to reduce the amount of pollutants in urban runoff. Permits for discharge to listed water bodies having a TMDL must be consistent with the waste load allocations in a TMDL. Under California law, TMDLs include implementation plans for meeting water quality standards. The implementation plans allow for time to implement control strategies to meet water quality standards.

## Potential Benefits

The primary benefits of urban stormwater runoff management are to reduce surface water pollution and improve flood protection. Additional benefits may be to increase water supply through groundwater recharge in areas with suitable soil and geological conditions, and where pollution prevention programs are in place to minimize the impact on groundwater. Groundwater recharge and stormwater retention sites can also be designed to provide additional benefits to wildlife habitat, parks, and open space.

Underground facilities can store runoff and release it gradually to recharge a groundwater aquifer or release it to surface waters in a manner that mimics the natural hydrologic cycle. Captured stormwater can also be used as a source of irrigation water rather than using potable water. For instance, a school campus can solve its flooding problem and develop a new sports field at the same time. These may provide secondary benefits to the local economy by creating more desirable communities. By keeping runoff on a site, storm drain systems can be downsized, which could reduce the installation and maintenance costs of such systems. A watershed planning approach to managing urban runoff allows communities to pool economic resources and obtain broader benefits to water supply, flood control, water quality, open space, and the environment.

Statewide information on the benefits of increased management of urban runoff is not available, but examples from local efforts exist. The Fresno-Clovis metropolitan area has built an extensive network of stormwater retention basins that not only recharges more than 70 percent of the annual stormwater runoff (17,000 acre-feet [af]) and removes most conventional stormwater pollutants, but also recharges excess Sierra Nevada snowmelt during the late spring and summer (27,000 af). Los Angeles County recharges an average 210,000 af of storm runoff a year, which reduces the need for expensive imported water. Agencies in the Santa Ana watershed recharge about 78,000 af of local storm runoff a year. The Los Angeles and San Gabriel Watershed Council has estimated that if 80 percent of the rainfall that falls on just a quarter of the urban area within the watershed (15 percent of the total watershed) were captured and reused, total runoff would be reduced by about 30 percent. That translates into a new supply of 132,000 af of water per year or enough to supply 800,000 people for a year.

The City of Santa Monica is an example of a municipality that is taking a watershed approach to managing urban runoff. Santa Monica's primary goal is to treat and reuse all dry-weather flows. This turns a perceived waste product into a local water resource so that beach water quality is protected and the local nonpotable water supply is augmented. However, if dry-weather discharges are necessary, the city's secondary goal is to release only treated runoff into waterways. Both goals improve water quality of the

# Page: 6

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/27/2013 11:34:47 AM
Pollutants in urban stormwater runoff have the potential to degrade groundwater quality. However, good stormwater management practices can minimize these impacts and should be implemented.

existing budgets. The provisions of Proposition 218 have limited local municipalities' ability to increase fees to pay for services required to implement robust urban stormwater runoff management programs. Additional information on Proposition 218 is available in Volume 4.

## Effects of Urban Runoff on Groundwater Quality

The movement of pollutants in urban runoff is a concern. Urban runoff contains chemical constituents and pathogenic indicator organisms that could impair water quality. Studies by the EPA (U.S. Environmental Protection Agency 1983) and the U.S. Geological Survey (Schroeder 1993) indicate that all monitored pollutants stayed within the top 16 centimeters of the soil in the recharge basins. The actual threat to groundwater quality from recharging urban runoff depends on several factors, including soil type, source control, pretreatment, solubility of pollutants, maintenance of recharge basins, current and past land use, depth to groundwater, and the method of infiltration used.

## Nuisance Problems/Other Concerns

The presence of standing water in recharge basins and other drainage and storage structures can lead to vector problems, such as mosquitoes and the transmission of West Nile virus. The California Department of Public Health has developed guidelines that address the issue of vector control in basins. These same concerns also apply to the on-site capture of runoff for later use.

A number of state agencies are encouraging infiltration and have found it to be an effective means of dealing with surface water pollution and the excess volumes and velocities of runoff created in the urban environment. However, it is also acknowledged that infiltration is not appropriate in all circumstances. Examples of this would be the widespread use of infiltration in a brownfield development or infiltrating large amounts of water in hillside developments where slope stability may be an issue.

## Protecting Recharge Areas

Local land use plans often do not recognize and protect groundwater recharge and discharge areas. Areas with soil and geologic conditions that allow groundwater recharge should be protected where appropriate. If development does occur in these areas, the amount of impervious cover should be minimized, and infiltration of stormwater should be encouraged on both a regional scale as well as at the "lot" level. In 2010, the Los Angeles and San Gabriel Rivers Watershed Council (now known as the Council for Watershed Health) prepared a water augmentation study that looked at the results of stormwater infiltration and the impact on groundwater (Los Angeles and San Gabriel Rivers Watershed Council 2010). Refer to Volume 3, Chapter 25, "Recharge Area Protection," for additional information.

## Misperceptions

There are many misperceptions about urban runoff and its management. Urbanization changes the native landscape and creates many sources of urban runoff pollution. Urbanization brings about increases in impervious surfaces that do not allow precipitation to infiltrate into the ground, causing increased runoff volume and velocity that changes streams to become more "flashy." In addition, the traditional way that the urban environment has been landscaped (lawns) has called for the use of lawn care products to keep lawns green and free from weeds and other unwanted vegetation. The use of lawn care products creates a pollutant source when excess watering washes products off and into the storm sewer system. Likewise, the transportation system creates sources of runoff pollution.

# Page: 9

Number: 1 Author: Johnmchu Subject: Sticky Note Date: 11/26/2013 1:14:01 PM
This sentence is the only place that pathogens are mentioned. Further discussion is warranted and should be associated with surface water in addition to groundwater.

Number: 2 Author: Johnmchu Subject: Highlight Date: 11/14/2013 9:43:54 AM

Number: 3 Author: Johnmchu Subject: Highlight Date: 11/14/2013 3:26:25 PM
Instead of brownfield use "hazardous release site" as this is more inclusive. Additional examples of potential problems potentially due to increased infiltration are destabilizing empty swimming pools, flooding subsurface portion of buildings, and increased likelihood for liquefaction.

Storm sewer systems have been designed to carry water away from the urban environment in order to reduce localized flooding during storm events. The systems have worked well in this regard, which has led to the public often times viewing runoff as a waste. However, with increasing demands on a limited water supply (surface water and groundwater) and climate-induced changes in precipitation patterns, water that otherwise would run off and be discharged to surface waters is being viewed as a resource. Changes in how new developments are planned and built, and changes in how we manage the existing urbanized areas, can create opportunities to capture runoff for future use.

### Existing Codes

There are current codes and ordinances within State and local government that could conflict with some of the goals of managing urban runoff. Dry-weather flows have been shown to be significant sources of pollution, with one of the primary dry-weather flows being runoff associated with landscape irrigation and lawn watering. Reduction/elimination of these flows not only provides a water quality benefit, but also reduces the amount of potable water that is being used in a community. However, some municipalities have "green lawn" ordinances, and compliance oftentimes leads to runoff. Other codes require minimum street widths that can inhibit the minimization of impervious surfaces.

## Recommendations

### State

State agencies should:

1. Coordinate their efforts to decide how urban stormwater runoff management should be integrated into their work plans.
2. Coordinate their efforts to develop a single message to the public and local government regarding managing urban runoff through the use of low-impact development (LID) techniques.
3. Coordinate their efforts to develop appropriate site design requirements that can be incorporated into either local building codes or statewide building standards.
4. Lead by example by incorporating LID into projects to showcase the use, utility, and cost of the features. Site design should be given the same attention that indoor environmental quality, energy usage, etc., are given in the design, funding, and construction of public projects.
5. Encourage public outreach and education about the benefits and concerns related to funding and implementation of urban runoff measures.
6. Provide leadership in the integration of water management activities by assisting, guiding, and modeling watershed and urban runoff projects.
7. Work with local government agencies to evaluate and develop ways to improve existing codes and ordinances that currently stand as barriers to implementing and funding urban stormwater runoff management.
8. Provide funding and develop legislation to: support development of urban runoff and watershed management plans; enable local agencies and organizations to pursue joint-venture, multipurpose projects; and collect information on regional urban stormwater runoff management efforts.
9. Assist agencies with developing recharge programs with appropriate measures to protect human health, the environment, and groundwater quality.
10. Work with federal policymakers and industry to create research and development incentives and to develop standards to reduce urban runoff from transportation-related sources, including lubricant systems, cooling systems, brake systems, tires, and coatings.

# Page: 10

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/27/2013 11:36:02 AM

SCVWD recommends adding the following recommendation:

Develop minimum standards for dry wells and infiltration trenches for incorporation into the State Well Standards to ensure adequate groundwater protection.

11. Maintain a publicly accessible clearinghouse of information regarding practices that can be used to address water quality issues associated with urban stormwater runoff management.
12. Work with local government to seek legislative solutions to the limitations imposed by Proposition 218.

### Local Agencies and Governments

Local agencies and governments should:

13. Design recharge basins to minimize physical, chemical, or biological clogging; periodically excavate recharge basins when needed to maintain infiltration capacity; develop a groundwater management plan with objectives for protecting both the available quantity and quality of groundwater; and cooperate with vector control agencies to ensure the proper mosquito control mechanisms and maintenance practices are being followed.
14. Seek opportunities to include LID techniques in public works projects.
15. Work with the development community to identify opportunities to address urban stormwater runoff management, including LID, in development and redevelopment projects.
16. Develop urban stormwater runoff management plans, integrating the following practices into the development process:
    A. Understand how land use affects urban runoff.
    B. Communicate with other municipalities regarding how land use will change the hydrologic regime on a regional basis and how this change is being addressed.
    C. Look for opportunities to require features that conserve, clean up, and reduce urban runoff in new development and in more established areas when redevelopment is proposed.
    D. Be aware of technological advances in products and programs through communications with other municipalities, branches of local government, and professional organizations.
    E. Learn about urban runoff and watershed ordinances already in place. For example, the City of Santa Monica and the Fresno Metropolitan Flood Control District already have extensive urban stormwater runoff management programs in place.
    F. Integrate urban stormwater runoff management with other resource management strategies covered in this volume, including pollution prevention, land use planning and management, watershed management, urban water use efficiency, municipal recycled water, recharge area protection, and conjunctive management and coordinate both within and across municipal boundaries.
    G. Be sensitive to the fact there are going to be sites where it is not appropriate to infiltrate urban runoff and stormwater flows.
    H. Integrate urban stormwater runoff management with development goals and strategies in the community.
17. Communicate with citizens about pollution of urban runoff and what can be done about it.
18. Create lists of locally accepted practices that could be used at the homeowner level to address urban runoff.
19. Review codes and ordinances to determine whether there are impediments to managing urban runoff and amend these as needed or as is appropriate.
20. Coordinate urban stormwater runoff management with local water purveyors to ensure the goals and activities of each complement each other rather than conflict.
21. Seek opportunities to provide incentives for the installation of LID features at the lot level for new and existing developments.

# Page: 11

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/27/2013 11:36:44 AM
This section should be titled "Regional and Local Agencies and Government" as some of these efforts occur on a regional basis.

## Urban Stormwater Runoff Management in the Water Plan

[This is a new heading for Update 2013. If necessary, this section will discuss the ways the resource management strategy is treated in this chapter, in the regional reports, and in the sustainability indicators. If the three mentions aren't consistent, the reason for the conflict will be discussed (e.g., the regional reports are emphasizing a different aspect of the strategy). If the three mentions are consistent with each other (or if the strategy isn't discussed in the rest of Update 2013), there is no need for this section to appear.]

1

## References

### References Cited

California State University, Sacramento, Office of Water Programs. 2005. *NPDES Stormwater Cost Survey: Final Report*. Sacramento (CA): California State University, Sacramento. 296 pp. Contract 02-189-250-0. Prepared for: State Water Resources Control Board. Viewed online at: http://www.owp.csus.edu/research/npdes/costsurvey.pdf. Accessed: Oct. 29, 2012.

Los Angeles and San Gabriel Rivers Watershed Council. 2010. *Water Augmentation Study: Research, Strategy, and Implementation Report*. Los Angeles (CA): Los Angeles and San Gabriel Rivers Watershed Council. 75 p. Viewed online at: http://watershedhealth.org/Files/document/522_WAS_StrategyDocument_web.pdf. Accessed: Nov. 1, 2012.

National Resources Defense Council and University of California, Santa Barbara. 2009. *A Clear Blue Future: How Greening California Cities Can Address Water Resources and Climate Challenges in the 21st Century*. New York (NY): National Resources Defense Council. 53 pp. Technical report. Viewed online at: http://www.nrdc.org/water/lid/files/lid.pdf. Accessed: Oct. 29, 2012.

Schroeder RA. 1993. *Potential for Chemical Transport Beneath a Storm-Runoff Recharge (Retention) Basin for an Industrial Catchment in Fresno, California*. Sacramento (CA): U.S. Geological Survey. 38 pp. Water-Resources Investigations report No. 93-4140.

TreePeople. 2012a. "Collect the Rainwater." Beverly Hills (CA): TreePeople. [Web page.] Viewed online at: http://www.treepeople.org/collect-rainwater. Accessed: Oct. 29, 2012.

TreePeople. 2012b. "Cistern." Beverly Hills (CA): TreePeople. [Web page.] Viewed online at: http://www.treepeople.org/cistern. Accessed: Oct. 29, 2012.

U.S. Environmental Protection Agency, Water Planning Division. 1983. *Results of the Nationwide Urban Runoff Program: Volume 1 — Final Report*. Washington (DC): U.S. Environmental Protection Agency. 198 pp. EPA No. 832R83112. Viewed online at: http://www.epa.gov/npdes/pubs/sw_nurp_vol_1_finalreport.pdf. Accessed: Oct. 29, 2012.

# Page: 12

Number: 1 Author: shredhar Subject: Sticky Note Date: 11/20/2013 6:03:40 PM
This section should also reference urban runoff from homeless encampments

the public. For a more detailed discussion of this emerging issue, see BDCP and Delta Farmland section in this chapter.

## Agricultural Land Stewardship in California

### Article 13, Section 8 of the California Constitution

Article 13, Section 8 of the California Constitution restricts taxation of open space land, including farmland, to promote conservation, preservation, and continued existence of this necessary resource. Agricultural land in California comprises about 31.6 million acres (California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program 2008). About 12.4 million of these are cultivated, while the remaining 19.2 million acres are rangeland (California Department of Forestry and Fire Protection 2010). Agricultural land includes both cultivated and non-cultivated land used for production of plant and animal products. Stewardship of this land requires constant balancing among market forces, natural constraints, and ever-changing social expectations. Institutions and policies have been developed in response to these challenges. Public investment in water infrastructure (reservoirs, canals, drains, levees, dykes) has been in the forefront of these.

### California Land Conservation (Williamson) Act of 1965

Underscoring the economic importance of agricultural land, California lawmakers enacted the California Land Conservation Act of 1965 (Williamson Act) in order to protect agricultural land and open space from premature conversion to urban uses. The Williamson Act program is administered through the California Department of Conservation (DOC) Division of Land Resource Protection (DLRP), to promote land use planning decisions, which conserve farmland to the greatest extent feasible. About 16 million acres, roughly half of the farmland in California (cropland and rangeland), is covered by long-term contractual protections under the Williamson Act. At the time of this writing, the State no longer funds subvention payments to counties. Permanent protection of farmland through agricultural easements is partially funded by matching fund grants administered by DLRP, as part of the California Farmland Conservancy Program (CFCP).

### The Watershed Coordinator Grant Program

Also administered by DLRP, the Watershed Coordinator Grant Program supports projects implementing integrated resource management. This program works with landowners, building relationships, to build better, healthier watersheds. The projects include water conservation, erosion prevention, and public education for water quality, best management practices, science, and planning in watershed management. Other institutions supporting agricultural land stewardship include Resource Conservation Districts (RCDs), University of California Cooperative Extension offices (UCCE), Natural Resource Conservation Service field offices (NRCS), county Agriculture Commissioners, and the California Department of Food and Agriculture.

### The California Ag Visions Reports and Ag Vision Advisory Committee

The California Department of Food and Agriculture (CDFA) has sponsored an Ag Vision Advisory Committee leading to the development of the California Agricultural Vision Reports (*California Agricultural Vision: Strategies for Sustainability Report.* See

# Summary of Comments on Vol3_Ch21_AgLandsStewardship_PublicReviewDraft_Final_PDFed_fk.pdf

## Page: 4

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 9:22:37 AM

It would be helpful to include the current objectives of the CA Farmland Conservancy Program and the availability of funding for acquisitions.

### California Rangeland Water Quality Management Plan

In 1990, California's range livestock industry led by the California Cattlemen's Association developed a program of voluntary compliance with the Federal Clean Water Act, federal and State coastal zone regulations, and California's Porter-Cologne Act. This initiative led to the development of the California Rangeland Water Quality Management Plan (CRWQMP) for nonfederal rangelands, which was approved by the State Water Resources Control Board in 1995. The management plan provides for development and implementation of ranch water quality plans on a voluntary basis. In 1994, UC Cooperative Extension (UCCE) and NRCS began to develop education programs to support landowners in the development of individual water quality management plans. These plans focused on nonpoint source assessment, development of water quality protection objectives, implementation of practices, and monitoring in the short- and long-terms. Several workshops targeting landowners have been conducted throughout the state by UCCE. The program has been effective; the majority of ranchers who developed management plans went on to implement best management practices (BMPs).

### Payments for Watershed Services

These are new and voluntary market-based mechanisms that fund conservation easements and/or conservation practices on private lands for watershed services (i.e., to protect water sources and maintain and improve water quality). These programs include one or several buyers (public agencies, private companies, non-profits, consumers). Several of these programs are being implemented in the U.S. and in California.

## Potential Benefits of Agricultural Land Stewardship

Agricultural land stewardship should be included as an integral component of regional integrated resource planning, including watershed planning and implementation. Agricultural land stewardship can use stewardship practices to protect the health of environmentally sensitive land, recharge groundwater, improve water quality, provide water for wetland protection and restoration, reduce costs to the State for flood management, and aid riparian reforestation and management projects. Land can also be managed to improve water management, urban runoff control, water storage, conveyance, and groundwater recharge. These stewardship practices are attractive since they do not rely on construction of major facilities and provide a range of environmental co-benefits.

### Agricultural Land Stewardship Can Be Part of a Regional Strategy of Urban Growth Management

Agricultural land provides public benefits for floodplain management, scenic open space, wildlife habitat, and defined boundaries to urban growth. Stewardship provides the rural counterpart to urban efforts to encourage more water efficient development patterns. It also can minimize fragmentation of agricultural land by development that can decrease productivity and decrease the provision of ecosystem services. To maximize co-benefits, while respecting private property rights of owners of agricultural land, landowner incentives, including payments for watershed services, need to be carefully expanded.

#### Climate Change

Climate change is anticipated to increase average temperatures and cause changes to hydrology, which will have many direct and indirect impacts on agriculture in California. These impacts include a reduced snowpack, decreased water availability, increased evapotranspiration, and more intense flood events and

# Page: 7

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 9:29:21 AM

It may be useful to describe the federal NRCS programs that are implemented by local Resource Conservation Districts and the roles each play . These are mentioned in the CA Rangeland WQMP section, but a fuller description is needed somewhere in the document. Brief description of these programs and their primary objectives would be useful. Also, the relationship between private landowners, for whom most of these programs benefit and how public entities can assist and even partner for multiple party and ecosystem benefits.

Number: 2 Author: trachemm Subject: Sticky Note Date: 11/26/2013 9:58:34 AM

It would be good to include data collected by NRCS and others on the value of conservation practices. Much has been published on the value topsoil vs. the cost of replacing it. Also, include the results of ecosystem valuation studies.

## Major Implementation Issues

There are major issues related to improving agricultural land stewardship include mixing economic endeavors with environmental goals, economic markets, and land conversion. Increased focus on this strategy is necessary to implement regional integrated resource planning and management, and to demonstrate to the public the measurable benefits of stewardship. Land use change is a critical issue, as conversion from agriculture to urban and industrial land use can result in irreversible loss of a landscape's potential to provide food and multiple ecosystem services that benefit the public. Every year about 20,000 acres of rangelands are converted to other uses, which negatively impacts water provisioning, conservation of biodiversity, and open space (California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program 2008).

### Landowner Confidentiality and Privacy Protection

Many environmental regulatory programs understandably require information from working landowners about the effectiveness of grant funding made to help landowners comply with regulations. The issue has at least two facets. First, agencies have a responsibility to account for the expenditure of public funds to achieve resource protection and conservation. Second, there is an enforcement-related and scientific need for data on the effectiveness of funded agricultural land stewardship practices. . These data are necessary to document compliance, and to document value of agricultural land stewardship practices to the conservation objectives of the regulatory agency. For example, the State Water Resources Control Board has required farm-specific information as part of the public record of its agricultural water quality grant programs. Besides the vulnerability that farmers and ranchers feel from other regulatory programs that might use the information, the requirement conflicts with USDA's conservation assistance programs and may prevent better leveraging of funds and coordination among agencies with similar goals of agricultural land stewardship.

### Leadership

Most states maintain a state council or similar leadership and coordinating body that provide guidance to federal, state, and local programs to achieve agricultural land stewardship. Some have regulatory or oversight authority over local conservation work that uses state and federal funding; others simply set state goals for conservation and serve as a venue for coordination and problem-solving for state programs as well as local conservation entities, especially resource conservation districts.

California once supported a governor-appointed Resource Conservation Commission that served primarily in the former capacity. The commission failed to keep pace with the changing paradigms of conservation, including the definition of conservation, with the move from structural solutions to bioengineering technologies. The commission, though still authorized in statute, has ceased to operate due to a lack of funding and commissioner appointments. The California Association of Resource Conservation Districts, among others, has called for the re-creation of at least a State conservation advisory council. Based in part on the positive experience with the former CALFED Bay Delta Program Working Landscape Subcommittee, the secretaries of the Natural Resources Agency and the Department of Food and Agriculture explored the creation of a working land stewardship council made up of stakeholders and agencies to identify and pursue coordinated initiatives in support of agricultural land stewardship. To date, no such State leadership body exists. The California Watershed Council may help to fill this void.

# Page: 10

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 9:59:58 AM

Discuss gap in leadership and the need for a coordinated effort between land resource agencies and the stewards of watersheds. Partnership among these various entities should be encouraged by the California watershed council.

## Underserved Agricultural Land Stewardship Stakeholders, Communities, and Regions

For a variety of reasons, including language barriers, the remoteness and size of communities that affect their capacity to be heard, some landowners, communities, and regions may not receive the share of agricultural land stewardship resources that is warranted by their agricultural land stewardship resource problems.

## Regulatory Barriers to Agricultural Land Stewardship, the Burden of Bureaucracy, and Regulatory Assurances

There is an ongoing need for interagency coordination and alignment of policies and regulations to clarify regulatory barriers, reduce unnecessary burden of multiple bureaucracies, and provide greater regulatory assurances to landowners that complying with one agency's programs will not put them at fault with another agency's regulations. In December 2010, the California Roundtable on Agriculture and the Environment (CRAE) members, reached consensus on a set of recommendations to facilitate the permitting processes for on-farm environmental restoration projects. These recommendations are detailed in the CRAE report, *Permitting Restoration: Helping Agricultural Land Stewards Succeed in Meeting California Regulatory Requirements for Environmental Restoration Projects*. See http://aginnovations.org/images/uploads/Permitting_Restoration.pdf .

Federal, State, and local regulations and permits may present crippling barriers to agricultural land stewardship. The issue may simply be the time, complexity, and cost of complying with regulations relative to the agricultural land stewardship benefits to be achieved. The issue may be the costs and bad fit of regulations resulting from the application of regulations intended for urban land uses and settings to the rural conditions of the agricultural working landscapes. In at least a few circumstances, the application of one agricultural land stewardship practice may place a landowner in jeopardy with another environmental protection standard. The application of a conservation practice that could result in the incidental take of listed Endangered Species Act species is one example.

Landowners often do not pursue available conservation financial assistance because of the amount of paperwork and the process that they must go through to receive funding. This issue is often a problem of striking a balance between funding accessibility and the need to be accountable to the public for the effective and legal expenditure of funds. The liability that administrators face can lead to a cumbersome bureaucracy that is not commensurate with level of assistance being offered. In addition, farmers and ranchers may have an inherent mistrust of government entities, which prevents them from participating in stewardship programs[1]

As previously noted, divulging personal or site-specific information to a granting agency can open a landowner to further regulatory liability. Similarly, there remains an issue that "no good deed goes unpunished" among some landowners who fear that on-farm conservation, for example, can lead to the improved health in the population of a listed species, leaving the landowner at greater risk of Endangered Species Act sanctions. If a landowner improves the protection of listed species, and the species become more abundant on their land, regulators have been known add greater restrictions onto the landowner, to protect the now abundant local population. The issue is the need for more and easier-to-employ opportunities for regulatory assurances that good conservation deeds will not be punished, and will be rewarded.

# Page: 11

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 10:00:40 AM

Discuss successful efforts at streamlining permit coordination- (eg Sustainable Conservation) to assist private landowners through the maze of permitting,

## Agricultural Conservation Easements are Forever

There is a growing awareness of the need for agricultural conservation easements to protect land from the fragmentation of agricultural landscapes into parcels that are too large to mow and too small to farm. Yet, producers often loathe giving up their future "retirement account" of subdivision potential forever. There are available ways to enable producers to use easements as an aid to financial and estate planning, but too few producers know about them. One example is the use of clustering development to gain development value income while protecting the bulk of the land for agriculture in ways that do not impede surrounding agricultural uses or exacerbate the provision of urban services by cash-strapped counties.

## Farm Market and Economic Considerations

The three legs of sustainability include economic, environmental, and social equity sustainability. A growing body of environmental, labor, food safety, land use, and other regulations has increased the cost of doing business in California. Land costs have increased as demands for housing and open space compete for land. Trade liberalization and international competition from developing countries with lower labor costs and regulatory standards have driven up the prices California producers can command in the marketplace. These issues and other factors make choices to invest in agricultural land stewardship practices difficult. Finding market value for the environmental services that Californians demand from agriculture is one key to keeping the California working landscapes profitable and sustainable. These services include:

- Spreading floodwater during high flows.
- Settling sediment during flood flows.
- Improving wildlife habitat and recreational opportunities, scenic places, and open space.
- Harvesting renewable energy,
- Sequestering carbon and providing clean air.
- Recharging groundwater.
- Providing clean and more abundant water supplies

## Landowner Concerns

Landowners are concerned that environmental programs that help them improve habitat might attract more threatened and endangered species affecting landowners' use of land. Thus, some landowners are reluctant to be involved with government agencies, even though some of these agencies might help landowners to comply with regulatory requirements.

Federal Endangered Species Act assurances can be granted only by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. In order to determine what type of species must be covered and the possible protective measures that may be required, surveys are necessary to determine what species are present. This only increases landowner concerns that they will be subject to increased restrictions if the presence of endangered species is verified on their property.

Some landowners question how they can adequately maintain their privacy and, at the same time, satisfy the public need for information of farm activities supported by public resources. In addition, there is landowner confusion regarding what type of assurances can be provided. One perspective is that the economic return from certain land stewardship programs may often be less than the return from other options for land use, especially when urban development is an option.

# Page: 14

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 10:01:24 AM

Should mention that ag easements offer “up-front” dollars to the ag operator while they can continue farming. There is a benefit to these land owners in exchange for giving up their development rights.

C. Measures to ensure implementation of findings should be included in assessment mandate.

D. State and federal agencies should work with stakeholders to develop and implement payments for ecosystem services programs that compensate landowners for their stewardship while reducing the cost of regulatory compliance and delivering measurable conservation benefits.

## B. Regulatory and Process Recommendations

2. State funding and staff should be made available through collaboration with the U.S. Department of Agriculture Natural Resources Conservation Service, State Resource Conservation Districts, and appropriate non-profit conservation organizations to develop a one-stop shop for local and regional-level permit coordination and assistance programs. The California Environmental Protection Agency and the Natural Resources Agency should implement this recommendation through use of bond funds, redirection of staff, and use of existing local capacity-building programs such as the Department of Conservation's Watershed Coordinator Program. This recommendation should be implemented immediately. Performance measures include reduced cost, time, and liability for landowners to implement agricultural land stewardship practices and strategies.
3. State resource protection regulations should be amended to allow qualified third party verification that grant funding to assist landowners in complying with regulations is spent appropriately and effectively. Regulations should also be amended to support collection of monitoring data in a manner that protects landowner confidentiality and enables federal participation in conservation actions that assist with regulatory compliance and the development of data on the effectiveness of agricultural land stewardship practices. Regulatory agencies, particularly the Air Resources Board, the Regional Water Quality Control Boards, and the Department of Fish and Game should assess regulations and the need for amendments in the near-term, and propose changes for mid-term achievement of this recommendation. Performance measures would include greater State and federal collaboration in assisting landowners in meeting regulatory requirements, providing sufficient data on the effectiveness of agricultural land stewardship practices in meeting resource protection regulatory requirements, and an increased level of participation among private landowners in State grant programs intended to assist regulatory compliance.
4. The Natural Resources Agency is facilitating the development of a Bay Delta Conservation Plan and the California Department of Fish and Game's Natural Community Conservation Plan to provide regulatory assurances and incidental take permits for water agencies to pump water from the Delta while also implementing a conservation plan to protect Endangered Species Act-listed fish species. The Natural Resources Agency and Department of Food and Agriculture should offer similar leadership as needed to implement Integrated Regional Water Management Plans where agricultural land stewardship is a key component of the regional plans. This is a mid-term recommendation pending adequate staff resources and bond funding availability. A performance measure would be increased implementation of agricultural land stewardship practices that improve terrestrial and aquatic habitat and species diversity.
5. Integrate responses to the overlap of existing and forthcoming regulations on climate change, flood control, air and water quality, biodiversity protection, etc., to achieve greater compliance and efficiencies.

# Page: 19

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 10:33:42 AM

Include a discussion of how municipalities, local water districts, and other regional agencies can partner to encourage agricultural preservation. For example, agricultural mitigation banks could be adopted and fully utilized by municipalities and counties.

such work. This authority and needed funding should be returned to the Natural Resources Conservation Service as part of its conservation operations and technical assistance budgets. Every Farm Bill conservation program should include funding to document not only program effectiveness, but also to share information about the programs and their supported practices with other growers through educational materials, field demonstrations, and workshops. This recommendation should be implemented immediately in the near- and long-term as U.S. Department of Agriculture's budget appropriations are made each year, and as Farm Bill reauthorizations occur every five or so years. Although current demand is about three times the amount of current funding, performance measures for this recommendation would be greater demand for U.S. Department of Agriculture's conservation program funding and technical assistance, and greater awareness among working landowners of conservation programs.

20. State grants that support agricultural land stewardship should likewise include a requirement that each grantee document project success and share lessons learned and successes with other growers and granting agency managers. This recommendation should be implemented, as bond authorities allow, immediately. As with demand for federal funding, current demand for State grants exceeds available resources. Performance measures for this recommendation would be greater demand among stakeholders and agencies for funding of effective agricultural land stewardship practices and strategies, and the requirement that such funding includes funding for demonstration and outreach.
21. The Department of Conservation Farmland Conservancy Program's funding for planning grants should be expanded in support of recommendations 22 and 23 below. The governor's office should work with the Legislature to acquire bond measure appropriations that support the Farmland Conservancy Program, specifically for its planning grants. This recommendation should be implemented immediately and in the long-term as new bond measures are placed on the ballot. See performance measure for recommendation 22.
22. The Department of Food and Agriculture and the Department of Conservation should seek funding to support an interagency technical outreach team to facilitate the transfer of technology with respect to agricultural land protection via agricultural conservation easements. The team would work with county planners and agricultural commissioners by sharing information on innovative farmland protection programs and ordinances in other counties. The team would also educate landowners about the tax relief, estate planning, and other benefits of agricultural conservation easement. This recommendation could be implemented immediately through an interagency agreement and a minor reallocation of staff resources. Performance measures for this recommendation would be transfer of successful agricultural land protection programs to other counties, and a greater demand for agricultural conservation easements and the funding to purchase them.

## II. Recommendations for Local Action

23. Integrated Regional Water Management Plan (IRWMP) applications for funding should embody agricultural land stewardship components where the region addressed by the plan includes agricultural land. Criteria, incentives, and education should focus on these goals. This recommendation should be implemented immediately if not already. Performance measure is IRWMPs are comprehensive and integrated, including supportive agricultural land stewardship measures and strategies where appropriate.

# Page: 23

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 10:45:41 AM

The State should not dictate the projects in IRWM funding applications. Ag land stewardship may not be at the top of the priority list for the region. Other needs such as providing safe water to disadvantaged communities may be higher priority.

Further, given the competitive nature of the grant applications and requirement for economic analyses, it would be helpful have to more information on valuing ag land preservation before implementing this recommendation.

Number: 2 Author: trachemm Subject: Highlight Date: 11/26/2013 10:38:52 AM

# Chapter 22. Ecosystem Restoration

Ecosystem restoration improves the condition of California's modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations. Few, if any, of California's ecosystems can be fully restored to their pre-development condition. Instead, efforts focus on rehabilitation of important elements of ecosystem structure and function. Successful restoration increases the diversity of native species and biological communities and the abundance of habitats and connections between them. This can include reproducing natural flows in streams and rivers, curtailing the discharge of waste and toxic contaminants into water bodies, controlling non-native invasive plant and animal species, removing barriers to fish migration in rivers and streams, and recovering wetlands so that they can store floodwater, recharge aquifers, filter pollutants, and provide habitat.

## Overview

This strategy focuses on restoration of aquatic, riparian, and floodplain ecosystems because they are the natural systems most directly affected by water and flood management actions, and are particularly vulnerable to the impacts of climate change. Today, water and flood planning must prevent ecosystem damage and reduce long-term maintenance costs. Future water and flood management projects that fail to protect and restore their ecosystems will face reduced effectiveness, sustainability, and public support.

Restoration generally emphasizes recovery of at-risk species and natural communities, usually those whose abundance and geographic range have greatly diminished. These include several fishes, such as delta smelt, longfin smelt, green sturgeon, Chinook and coho salmon, and steelhead rainbow trout. Also included are riparian and wetland habitats and their member species, including valley elderberry longhorn beetle, giant gartersnake, and several migratory bird species. Successful restoration of aquatic, riparian, and floodplain species and communities ordinarily depends upon at least partial restoration of the physical processes that are driven by water. These processes include the flooding of floodplains, the natural patterns of erosion and deposition of sediment, the balance between infiltrated water and runoff, and substantial seasonal variation in stream flow. Another barrier to ecosystem restoration — displacement of native species by exotics — often results from the diminution of these same physical processes.

As an example, nearly all California waterways are controlled to reduce the natural seasonal variation in flow. Larger rivers are impounded to capture water from winter runoff and spring snowmelt and release it in the dry season. Many naturally intermittent streams have become perennial, often from receipt of urban wastewater discharges or from use as supply and drainage conveyances for irrigation water. The Sacramento-San Joaquin Delta (Delta) has become more like a year-round freshwater lake than the seasonally brackish estuary it once was. In each case, native species have declined or disappeared. Exotic species have become prevalent, often because they are better able to use the greater or more stable summer moisture and flow levels than the drought-adapted natives are.

## Current Activities

Many important recovery efforts that affect water and flood management occur throughout California and are performed by public agencies, private agencies, non-profits, volunteers, or a combination of all the above. Some examples appear below.

# Summary of Comments on Reviewer Instructions for the Resource Management Strategies

## Page: 3

Number: 1 Author: trachemm Subject: Highlight Date: 11/26/2013 11:31:55 AM

Number: 2 Author: trachemm Subject: Sticky Note Date: 11/26/2013 11:31:49 AM

This sentence isn't necessarily true. Maybe change to, "Successful restoration often increases the diversity of native species and biological communities and the abundance of habitats and connections between them. 7

Number: 3 Author: trachemm Subject: Sticky Note Date: 11/26/2013 11:31:44 AM

Restoration or rehabilitation would be betters word than recovery.

Number: 4 Author: trachemm Subject: Highlight Date: 11/26/2013 10:58:55 AM

forest and grassland habitat. The new, larger more durable levee, set back from the erosive forces of the river, improved flood protection for the urban area behind it.

## Potential Costs

A comprehensive statewide summary of the costs of ecosystem projects does not exist. However, as of 2011, the Ecosystem Restoration Program, now managed by California Department of Fish and Wildlife, had funded 579 projects, worth about $718 million. About half of that amount was spent for riparian habitat, fish screens and improvements to water and sediment quality.

Under the authority of the Central Valley Project Improvement Act, State and federal government spent about $630 million for fish and wildlife restoration since 1992 (U.S. Department of the Interior 2005).

The Central Valley Joint Venture has used a mix of public and private funds to accomplish its goals. Table 22-1 below (updated March 2011) illustrates the budgets and the acres of habitat conserved (Central Valley Joint Venture 2011).

**PLACEHOLDER Table 22-1 Acres Conserved by Central Valley Joint Venture**

[Any draft tables, figures, and boxes that accompany this text for the public review draft are included at the end of the chapter.]

As of 2010, the Southern California Wetlands Recovery Project has spent more than $450 million completing projects from Santa Barbara County to San Diego County (Southern California Wetlands Recovery Project 2010).

## Major Implementation Issues

### Climate Change


Climate change will likely make preservation and restoration of key habitats more difficult. Perhaps the most important reason for this is an expected decline in the availability of moisture. A combination of rising temperatures, more intense floods, a smaller snowpack, more frequent drought, and more frequent and intense wildfires will reduce both surface and groundwater storage as more water runs off or evaporates and less water infiltrates into the ground. These changes in temperature and moisture will force species and natural communities to move with their preferred temperature and moisture regimes — uphill, northward, and into cool canyons — until blocked by topographic or other barriers. The result is that many species and ecosystems will occupy ever smaller and more isolated patches of physical habitat. As their abundance declines, more species will risk extinction.

Two examples are especially relevant to water and flood management. First, in many low- and middle-elevation streams today, summer temperatures often approach the upper tolerance limits for salmon and trout; higher air and water temperatures will exacerbate this problem. As the timing of peak tributary runoff shifts toward winter, less of the winter flow is likely to be captured in reservoirs. This will leave less cold water for fish in spring and summer. Thus, climate change might require dedication of more water simply to maintain existing fish habitat, and plans to expand habitat will face stiffer competition from other demands on water.

# Page: 8

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 11:31:36 AM
Should funding be listed as an implementation issue?

The second example results from the continued rise in sea level and upstream encroachment of salt water. As this happens, the brackish and fresh aquatic habitats of the Sacramento-San Joaquin Estuary, which are critical to many at-risk species, will shift upstream and inland. Continuing urbanization on the edges of the Delta will limit opportunities to acquire or restore lands that could provide suitable habitat. Thus, threatened and endangered species could be increasingly squeezed between the inland sea and the encroaching cities.

### Conflicting Objectives with Traditional Flood Management

Ecosystem restoration and traditional flood management often have conflicting objectives. Traditional flood planning assigns all the physical space in a river channel to floodwater conveyance and leaves little room for habitat values. Many of the greatest opportunities for ecosystem restoration, especially in the Central Valley and other valleys, require incorporation of habitat into the flood protection system. At this early stage in statewide flood planning, there is a lack of consensus on how to design such an integrated system and on the desirability thereof. For example, many would balk at using newly-created flood capacity in a river channel to make room for forests.

Californians need to be satisfied that the promise of an integrated approach to flood and ecosystem management can provide habitat without greater risk of flood damage. A habitat project that fails to achieve its objectives is costly, but not dangerous. In contrast, a flood protection project that fails can mean catastrophe for life and property.

### Opposition to Conversion of Farmland to Habitat

Many of the opportunities for ecosystem restoration are on land that is now farmed, especially in the Central Valley and the Delta. Although some habitat types, such as seasonal wetlands, can be farmed at other times of year, others, such as riparian forest and most permanent wetlands, cannot. Thus, significant amounts of habitat restoration on arable land, coupled with continued urban growth, could hasten the decline of some forms of agriculture in California. The loss of farmland, especially for habitat uses, is controversial.

## Instream Flows


Restoration of adequate instream flows and channel and floodplain form and function is a priority for the California Department of Fish and Wildlife (DWF). DFW has legal mandates to determine flows that will ensure the viability of fish and wildlife, identify the watercourses to evaluate, initiate flow studies, and develop and submit recommendations to the SWRCB for use in allocating water. Much work remains to complete studies and develop recommendations. Until then, incomplete knowledge will hamper restoration of adequate stream flows.

### Mercury Contamination


Wetland restoration carries the potential for methylmercury contamination. Some seasonally and permanently flooded wetlands can convert elemental mercury to methylmercury. Methylmercury is highly toxic and can accumulate in natural food chains and in fish that people eat. Many areas targeted for habitat restoration, particularly in and near the Delta, are contaminated with mercury. Hence, wetland restoration in those areas could exacerbate methylmercury production. The SWRCB approved a basin plan amendment for the control of methylmercury and total mercury in the Delta in 2011. The regulation

# Page: 9

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 11:31:30 AM
The potential conflict between instream flows and water supply needs should be mentioned.

Number: 2 Author: trachemm Subject: Sticky Note Date: 11/26/2013 11:31:28 AM
This section is out of place - it doesn't belong under instream flows. It should be a separate implementation issue.

requires wetland project proponents to take part in evaluations of practices to reduce methylmercury discharges and apply controls.

## Recommendations

1. Devise climate change adaptations that benefit both ecosystems and water and flood management. The principal predicted effect of climate change on California ecosystems is that it will further fragment and shrink them. Thus, appropriate corrective actions should serve to reconnect and expand them. The overarching recommendation is to establish large biological reserve areas that connect or reconnect habitat patches. These proposed "landscape reserves" are discussed further in the biodiversity and habitat section of the California Natural Resources Agency's Climate Adaptation Strategy (2009). More specific measures that can help ecosystems adapt to climate change are those that integrate ecosystem restoration into flood and water projects. The following measures were discussed above:
   A. Reconnect rivers to their historic floodplains as part of new flood management approaches.
   B. Increase the use of setback levees and floodwater bypasses.
   C. Expand lowland riparian forest acreage in the form of continuous corridors along watercourses.
   D. Set aside habitat in the Delta to compensate for habitat lost to sea level rise.
   E. Restore mountain meadows.
2. Promote multidisciplinary approaches to water and flood management. Conflicting objectives are commonplace in water and flood planning which makes it essential to foster broad participation and collaboration among the affected parties to generate a shared vision of water and flood management that incorporates multiple interests. One promising approach is to devise a system of payments for ecosystem services in which beneficiaries pay natural resource managers for practices that support and enhance the desired goods and services. Stakeholders must identify and agree on what the relevant goods and services, the beneficiaries, and the monetary value of the benefits are.
3. Expand financial incentives for farmers to grow and manage habitat. Programs such as the Environmental Quality Incentives Program administered by the USDA, Natural Resources Conservation Service (NRCS) and DWR's Flood Corridor grant program are examples of the direction that expansion could take. See Chapter 21, "Agricultural Land Stewardship," in this volume for further discussion.
4. Provide for instream flow needs. Provide a comprehensive and appropriately funded program to identify instream flow needs, perform the necessary studies, and make scientifically defensible recommendations for instream flows to protect fish and wildlife.
5. Continue collaboration between wetland stakeholders and Regional Water Quality Control Boards (RWQCBs) to reduce mercury contamination. Wetland stakeholders are working with the RWQCBs to identify and conduct research to reduce human and ecosystem exposure to mercury without preventing other efforts to improve ecosystem health through wetland restoration.

## Ecosystem Restoration in the Water Plan

[This is a new heading for *California Water Plan Update 2013* (Update 2013). If necessary, this section will discuss the ways the resource management strategy is treated in this chapter, in the regional reports

# Page: 10

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 11:31:20 AM

There should be recommendation about protecting/preserving riparian and floodplain lands, especially as it relates to land use planning and management.

Also, there should be a recommendation about resolving sometimes conflicting environmental permitting requirements/the need for regulatory alignment to support ecosystem restoration.

Number: 2 Author: trachemm Subject: Highlight Date: 11/26/2013 11:23:35 AM

Number: 3 Author: trachemm Subject: Sticky Note Date: 11/26/2013 11:31:24 AM

This information about payments for ecosystem services seems more relevant to recommendation #3 about financial incentives.

protect water quality is routinely included in suppression efforts on both National Forest and non-federal lands in California. Fire control lines, particularly those created by heavy equipment, disturb the soil, increase soil compaction, reduce infiltration, can become sources of sediment if not properly rehabilitated, and can alter runoff patterns (Neary et al. 2005; Backer et al. 2004). Practices used to reduce these impacts include installation of proper drainage structures on firelines and roads, and removal of soil from emergency stream crossings built when constructing firelines with crawler tractors.

Following fire containment, burned areas associated with wildfires greater than 500 acres on National Forest lands are assessed, and high-risk areas with downstream values-at-risk are treated to prevent adverse effects on water quality and other resources (Robichaud et al. 2000). Values-at-risk refers to natural resources such as salmonid habitat and human communities that may be adversely affected by the movement of water and sediment from burned areas.

The USFS uses its Burned Area Emergency Response (BAER) program to prescribe practices to reduce erosion potential, as well as to reduce threats to life and property. Similarly, at the direction of the governor, California's Emergency Management Agency (Cal EMA), Natural Resources Agency, and Environmental Protection Agency (Cal EPA) assemble multi-disciplinary teams when necessary to assess post-wildfire potential impacts to life and property on state and private lands. Commonly specified measures include notification of residents in areas at risk for debris slides and channel-derived debris flows, use of automated precipitation and stream gauges linked to local government response and flood control agencies for early warning for evacuation, road and stream crossing improvements, installation of structure protection devices (e.g., K-rails), and on USFS lands where there are high values-at-risk, such as aerially applied straw mulch, and hydro-mulch (Robichaud et al. 2000; Wohlgemuth et al. 2009). Aerial grass seeding has rarely been used in California after 2000, since it has not been shown to be effective in reducing hillslope erosion and often inhibits native species regeneration (Conard et al. 1995; Wohlgemuth et al. 1998; Beyers 2004). Post-wildfire assessment programs will likely become increasingly important in the future due to projections of higher frequency and intensity of wildfires related to climate change.

### Recommendations

It is recommended that watershed protection be enhanced through the strategic placement of fuel reduction projects in high priority water supply watersheds, (high priority water supply watersheds are displayed in Chapter 3 of the *2010 Assessment of California's Forest and Rangelands* [CAL FIRE 2010a]) utilizing existing state and federal cost-share programs on non-federal wildlands (CAL FIRE 2010b). Fuel reduction projects should use: (1) mechanical thinning treatments that limit ground disturbance, particularly on steeper slopes and more erodible soil types (Cram et al. 2007), and include appropriate road design, construction, and maintenance practices, (2) mastication where slope gradient is appropriate, and (3) low severity prescribed fire preserving the litter/duff layer and existing nitrogen levels. Fuel reduction treatments, such as thinning, can reduce the threat of high intensity wildfire, and make California forests more resilient in warmer climates (Bales et al. 2011), as well as providing other ancillary benefits, such as biogeneration of power.

## Road Management

Thousands of miles of roads have been constructed through forests in California, primarily to provide access for timber harvest. The 18 National Forests in California alone contain approximately 50,000 miles of forest roads, of which roughly 20,000 miles may no longer be needed for their original purposes

# Summary of Comments on Vol3_Ch23_ForestMgmt_PublicReviewDraft_Final_PDFed_fk.pdf

## Page: 15

Number: 1 Author: trachemm Subject: Sticky Note Date: 11/26/2013 12:08:33 PM
There should be some discussion about the differences/similarities of fire suppression and fuel management.

### Recommendations

- Fund urban tree planting in high priority communities, which should yield multiple water use benefits, such as reductions in stormwater runoff and improved water quality, among other benefits such as air pollution mitigation and reduced energy use. The 2010 Forest and Range Assessment (CAL FIRE, 2010a) identified 372 communities as high priority areas for urban tree planting in order to conserve energy or improve air quality.
- Preserve space for large-statured trees in new developments and create such space in developed areas that currently do not have adequate planting sites. Preserving and planting large-statured trees will have a large beneficial impact and improve the extent of urban tree canopy in priority areas. Additionally, improved management of existing urban forest resources will assist in maximizing the benefits of current tree canopy while minimizing long-term costs.
- Encourage and implement BMPs that promote urban forestry for urban stormwater management, which take advantage of benefits offered from tree canopy interception for reduced peak stormwater flows, reduced runoff volume, and removal of pollutants. Use of a variety of stormwater management techniques should be encouraged to maximize urban tree benefits to water resources.

## Climate Change

Forests will play an increasingly important role in protecting California's watersheds and associated water supply as the climate warms and precipitation patterns become increasingly variable. Climate change impacts on California's forests that have been measured in the past 100 years include a 10 percent decrease in snowpack, changes in streamflow timing, increased wildfires, and more severe pest outbreaks (California Department of Water Resources 2008).

While susceptible to anticipated changes, proper management of forest habitat provides both climate change adaptation and mitigation benefits. The U.S. Department of Agriculture Forest Service has prepared a resource titled *Responding to Climate Change in National Forests: A Guidebook for Developing Adaptation Options* (U.S. Department of Agriculture Forest Service 2011a). The guidebook is based on the "science-based principles, processes, and tools necessary to assist with developing adaptation options for national forest lands," which can be useful for all forest managers seeking guidance on climate change. One of the key components of successful adaption in forests will be long-term monitoring and research on the various recommendations and policies that are currently promoted and an adaptive management approach that allows incorporation of new information into the existing management paradigm.

### Adaptation

Many existing forest management practices can promote resilience to climate change, and, in fact, the best way to ensure successful implementation of high priority actions is to integrate climate adaptation into existing planning and operational processes. For example, strategic forest road management will be important in areas prone to flooding and erosion, which can significantly affect water quality due to sediment transport. Incorporating anticipated climate change impacts and vulnerabilities into road management plans and policies will ensure that priorities are based on the changed conditions under which forest roads will need to be managed in the future. Fuel reduction plans should also incorporate climate change considerations so that the threat of high intensity wildfire situations can be reduced.

# Page: 20

Number: 1 Author: trachemm Subject: Highlight Date: 11/26/2013 12:12:48 PM

Number: 2 Author: trachemm Subject: Sticky Note Date: 11/26/2013 12:13:14 PM

Need to relate this recommendation to water/water management benefits.

sidewalks. Average annual tree maintenance costs in California, including planting and maintenance, vary from $13 to $65 annually per tree, with costs higher on public vs. private lands (McPherson et al. 2005).

## Major Implementation Issues

The issues described in this section are challenges for implementing one or more of the activities described in the Quantify Benefits section.

### Information Needs

Forest management agencies and private timber companies are conducting a number of long-term studies in forested watersheds, including Redwood Creek, Caspar Creek, and South Fork Wages Creek in the northern part of the Coast Ranges; Little Creek in the central part of the Coast Ranges; Judd Creek and Battle Creek in the northern Sierra Nevada; Frasier Peak Creek and Bear Trap Creek in the central Sierra Nevada; and Speckerman Creek, Big Sandy Creek, and the Kings River Experimental Watershed in the southern Sierra Nevada. These studies are providing valuable information about the effects of forest management activities on water quality and quantity, particularly related to timber harvesting, road building, and fuel treatments.

Continued monitoring and additional studies are needed to better understand the effects of forest management activities on water quantity and quality over the wide range of climatic and physiographic conditions found in California. The processes and pathways by which water arrives at the land surface as rain or snow and then reaches stream channels, profoundly affects streamflow regimen, erosion, and contaminant transfer, but these processes are generally poorly understood. Methods for estimating evapotranspiration from different vegetation types need refinement and field verification. Knowledge of groundwater recharge, flowpaths, and storage is limited for mountainous forested watersheds, especially those underlain by fractured rocks. Sources of sediment, transport mechanisms, and the relative importance of erosional processes are not well documented.

Monitoring of streamflow to detect effects of land use is most useful on headwater streams that are not affected by artificial regulation or diversion (MacDonald and Coe 2007). A statewide network of 886 streamflow monitoring stations is operated in California by the U.S. Geological Survey (USGS), but only 214 of these gauges are on streams with more than 50 percent forest cover. Only 31 of these are long-term stations (20 or more years of record) on unregulated and undiverted streams, and very few of these stations include water quality monitoring (C. Parrat, USGS, written communication, 2008). That density is an average of one long-term stream gauge on an unregulated and undiverted stream for every 1,893 square miles of forest in the state, and some of these stations are in danger of closure due to inadequate long-term funding. A higher density of stream gauges and water quality monitoring stations would be helpful for understanding the distribution, timing, and quality of streamflow from forested watersheds across the state.

### Coordination Needs

Forest owners and management agencies have disparate management objectives and constraints, and forest ownership boundaries rarely coincide with natural watershed boundaries, which lead to fragmented, uncoordinated activities that are potentially not effective over the entire watershed. For example, USFS funds and staff can generally be used only for work on National Forest System lands, state agencies are

# Page: 23

Number: 1 Author: trachemm Subject: Highlight Date: 11/26/2013 12:16:08 PM

Number: 2 Author: trachemm Subject: Sticky Note Date: 11/26/2013 12:18:11 PM

The Quantify Benefits section is only discusses urban trees. A different section should be referenced here.

# Chapter 24. Land Use Planning and Management — Table of Contents

# Summary of Comments on Vol3_Ch24_LandUsePlanning_PublicReviewDraft_Final_PDFed_fk.pdf

## Page: 1

Number: 1 Author: georcook Subject: Sticky Note Date: 11/20/2013 11:39:50 AM

This section is heavy on climate change and compact sustainable development, but has minimal discussion of other land issues such as the impact on groundwater quality and siting issues.

Number: 2 Author: georcook Subject: Sticky Note Date: 11/20/2013 11:37:55 AM

This section is very well written and provides a comprehensive discussion of land use planning. SCVWD recommends that the focus of the chapter be narrowed down to the junction between land use planning and water issues. Examples of items included that extend beyond water issues are:

1. Infrastructure and property values
2. Fiscal policy constraints
3. Recommendations to incorporate wildlife habitat and recreational opportunities

Approximately 7 pages of this chapter are devoted to compact, sustainable development. SCVWD supports this type of development, and discussion is appropriate as it does apply to water supply/quality protection, but the discussion is much too detailed and broader than the relevance to water.

### *Governor's Office of Planning and Research*

The Governor's Office of Planning and Research (OPR) is responsible for coordination state functional plans, ensuring consistency with state policies. OPR, created by statute in 1970, is part of the Office of the Governor. OPR serves the governor and his cabinet as staff for long-range planning and research, and constitutes the comprehensive state planning agency (Government Code Section 65040). In addition, the Government and Public Resources Codes set forth multiple functions for OPR including:

- Formulation of long-range land use goals and policies.
- Conflict resolution among state agencies.
- Coordination of federal grants for environmental goals.
- Coordination of statewide environmental monitoring.
- Coordination of research on growth and development.
- Management of state planning grants and encouragement of local and regional planning.
- Creation and adoption of general plan guidelines.
- Drafting of CEQA guidelines for adoption by the Secretary of Natural Resources.
- Creation of a State Environmental Goals and Policy Report (EGPR), every four years.
- Operation of the State Clearinghouse for distribution and review of CEQA documents.
- Coordination of environmental justice activities.
- Coordination with U.S. military for land use and other issues in the state.

One of OPR's primary responsibilities is working with state agencies and departments, regional planning organizations, and local jurisdictions on topics relating to land use planning. OPR has developed numerous resources to assist local governments in managing land use related issues, including information related to infill, renewable energy, general plan guidelines, transportation, and more.

OPR is preparing an Environmental Goals and Policy Report for California. The 2012 EGPR will provide an overview of the state's environmental goals, key steps to achieving these goals, and develop a framework of metrics and indicators to help inform decision-making, at all levels, to help the state reach these goals.

California has established a series of ambitious environmental goals (e.g., the Renewable Portfolio Standard and the greenhouse gas emission reduction goals), including efforts to reduce greenhouse gas emissions, develop a clean economy, and provide clean air and water for all residents. By 2035, California will have a population of 50 million residents. The decisions that are made to accommodate this growth need to be made with the achievement of these environmental goals in mind. OPR is seeking to prepare an EGPR that is inspirational and forward-looking, broad and inclusive, and engaging and interactive.

### *Strategic Growth Council (SGC)*

The SGC, established through SB 732 in 2008, is a committee of the agency secretaries from Business, Transportation, and Housing; California Health and Human Services; California Environmental Protection Agency; and California Natural Resources Agency; as well as the director of the Governor's Office of Planning and Research and one public member appointed by the governor. The Council is charged with four main tasks to encourage the development of sustainable communities, summarized as follows:

- Coordinate state programs to achieve sustainability objectives.
- Provide local assistance.

# Page: 5

Number: 1 Author: georcook Subject: Sticky Note Date: 11/20/2013 9:32:10 AM
SCVWD recommends updating this paragraph to summarize the 2012 report.

emphasizes additional strategies to promote compact and sustainable urban and rural development, uses these accomplishments as a foundation.

## Climate Change

### *Adaptation*

Cross-sector collaboration on resources management will be critical for dealing with climate change impacts as they unfold. Urban planners, water managers, and ecosystem managers commonly work independently to plan for the future. However, to address the additional challenges effectively that climate change will bring, it will be imperative that both the built and natural environments are managed in a cohesive fashion at a landscape level, rather than as isolated, smaller pieces of the whole which has been done in the past.


DWR's Integrated Regional Water Management (IRWM) program is an example of a process that brings diverse stakeholders to the table for coordinated regional planning on water issues. As noted in DWR's White Paper, *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water* (DWR 2008a), IRWM planning, in combination with other regional planning efforts such as for transportation and land use, can serve as the basis for regional climate adaptation planning leading to increased resilience in all sectors.

As mentioned previously, the CCLU-In is the Climate Action Team subgroup that works to coordinate state efforts on climate adaptation in the land use sector. Many planning efforts for the built environment including those related to water resources, housing, transportation, hazard mitigation, and others will need to incorporate both mitigation and adaptation moving forward in the future. A web portal (http://www.climatechange.ca.gov/action/cclu/) containing information and links about the myriad of state documents and tools on climate change has been developed by the CCLU-In to assist local planners with incorporating climate change into their general plan updates and other key planning documents.

Another key source of climate change information for resource managers is the California Climate Change Portal (http://www.climatechange.ca.gov/). The Climate Change Adaptation Policy Guide (APG) for local governments and other important guidance for planners and resource managers can be found on this Web site. The APG addresses climate change adaptation at the local government level. It provides local government and regions with information and tools to assess anticipated changes and risks for that region due to the effects of climate change including sea level rise, greater flood intensity, and increased local flood risk. Once the assessment is done, the local government can review the APG for mitigation and adaptation measures for existing and future development.

One effort that could be important in coordinating planning efforts for the natural and built environments is the U.S. Dept of Interior-led Landscape Conservation Cooperatives (http://www.fws.gov/landscape-conservation/lcc.html). These management-science partnerships inform and promoted integrated science, natural resource management, and conservation to address climate change and other stressors within and across ecosystems. Representatives from state and federal agencies, universities, NGOs, tribes, and other interested parties work together to identify research gaps, fund projects, and disseminate information about climate change and other threats to the sustainability of natural resources. The California Landscape Conservation Cooperative (CA LCC) (http://californialcc.org/) has created an 'alliance' level of participation, which is open to all parties interested in integrated natural resource management. Urban planners and local government officials working on climate adaptation who join the CA LCC Alliance

# Page: 9

Number: 1 Author: georcook Subject: Sticky Note Date: 11/20/2013 9:43:08 AM

SCVWD agrees with the observation that "urban planners, water managers, and ecosystem managers commonly work independently to plan for the future". It should be recognized that this independent planning is inefficient and ineffective as these efforts involve activities that are interdependent. This statement is applicable to areas beyond responding to climate change.

coordination between SCSs and regional water planning. Additional planning and coordination costs may be incurred by MPOs to incorporate water resources management issues and concerns into future SCSs. Similarly, additional planning and coordination costs may be incurred by DWR and IRWMP preparers to use SCS growth forecasts as the demographic and land use basis for regional water planning

Transportation planning efforts which aim to achieve compact and sustainable urban development mentioned above are a major cost to regional and local governments. SB 375 will require regional planning agencies to incur increased planning costs to develop new land use allocations supporting RTPs. The new RTP EIRs will increase in cost and complexity. In addition to planning costs, there are much greater planning and implementation costs for RTP implementation as listed below in the Recommendations section.

### Regulatory Improvement and Streamlining

The existing regulatory framework across federal, state, regional, and local levels contains some inherent conflicts and contradictory directives, such as designated infill priority development areas conflicting with flood zones, environmental guidelines limiting proximity of housing to freeways or school location, and configuration guidelines that favor low density environments. Some state guidance can be considered separately from larger regional land use and transportation policies, which might confuse local jurisdictions on how to comply with multiple policy directions from the State.

### Issues for Sustainable Rural Development

Landowner incentives for maintaining agricultural land in agricultural use include the Williamson Act and conservation easements. However, state subventions to local governments for reduced property taxes associated with Williamson Act contracts have been eliminated, which may result in non-renewal of Williamson Act contracts over the long-term. Also, funding for conservation easements is threatened by the state's economic downturn, as well as reduced federal and state discretionary spending in budgets.

## Recommendations

### Promote Cross-Cutting Funding and Planning Programs

1. The State should provide additional incentives to developers and local governments to plan and build using more compact and sustainable development patterns. This could be done through further CEQA streamlining for infill development and associated infrastructure depending on SB 226's effectiveness, further reductions in brownfields liability for innocent land purchasers (http://www.epa.gov/oecaerth/cleanup/revitalization/ilo.html), prioritizing planning grants, and providing further incentives (financial and other) to encourage compact and sustainable development.
2. The State should develop and promote performance-based planning with metrics. Examples include establishing a baseline for each watershed for impervious surfaces, reduction of vehicle miles traveled per capita, planning and resource management that integrates multiple agencies and viewpoints, comprehensive flood management using floodplain planning, and land coverage.
3. These metrics should be the basis for evaluating projects that request discretionary state funding, grants, and other financial assistance.

# Page: 26

Number: 1 Author: georcook Subject: Sticky Note Date: 11/27/2013 11:30:56 AM
Limiting the liability may result in cleanup costs being borne by taxpayers.

Number: 2 Author: georcook Subject: Sticky Note Date: 11/20/2013 10:46:17 AM
SCVWD recommends combining items 2 and 3.

4. Local, regional, and state land use and water planning agencies should generally conduct an integrated review of long-range land use planning documents, infrastructure master plans, and financing strategies to ensure adequate support for long-term growth, and sustainable development in urban and rural areas.
5. The State should provide incentives for developing integrated water management elements in local general plans.

## Integrate Regional Water Management and Regional/Local Land Use Plans

6. Regional planning agencies should continue and expand their participation in the regional blueprint planning process.
7. Regional planning agencies should address water management issues in their blueprint plans and SCSs.
8. Local agency formation commissions (LAFCOs) should consider water management issues in the context of their principal purposes, which include discouraging urban sprawl, preserving open space and prime agricultural lands, efficiently provide government services, and encouraging the orderly formation and development of local agencies based upon local conditions and circumstances (Government Code 56301).
9. Local governments should coordinate with water planning agencies to promote integration of land use and water management planning. Examples of how this is currently being done include:
   A. Reviewing and submitting comments on the Urban Water Management Plans adopted by water agencies within their jurisdiction.
   B. Participating in the Integrated Regional Water Management planning and implementation processes.
   C. Continuing to implement SB 610 and SB 221effectively, which require land use approvals to consider whether sufficient water supplies are available to serve new development.
   D. Engaging relevant water management agencies to participate in general plan updates that address water issues.
10. When conducting general plan updates, local governments should address relevant water management issues including water supply, water quality, water affordability, flood risk reduction, and adequacy of services residents. This can be done by adding water management policies to the general plan elements currently required by statute, or by preparing an optional water element not required by statute. The discussion of water issues in general plans should be informed by IRWMPs and California Water Plan Regional Reports applicable to the city or county.
11. Local and regional water management and flood agencies should coordinate with local governments to promote integration of land use and water management planning. This should be done by:
    A. Participating in the general plan process in the communities they serve and submitting comments on general plan updates.
    B. Including local agency representatives, Regional Water Management Groups, which are the governing bodies for IRWMPs.
    C. Collaborating with local governments to identify opportunities to maximize water conservation, groundwater recharge, stormwater capture, and other water management strategies that rely on local land use planning for effective implementation.

# Page: 27

Number: 1 Author: georcook Subject: Sticky Note Date: 11/27/2013 11:42:07 AM
Regional planning agencies should also consult with the groundwater management agency(s) for their region.